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$$80\% + 1\frac{1}{5}\% = 81\frac{1}{5}\% ; 100\% - 81\frac{1}{5}\% = 18\frac{4}{5}\%.$$

$$\$564 \div 18\frac{4}{5}\% = \$3000.$$

The latter is commission on money invested and not brokerage on bills bought.

II. Solution by F. M. McGAW, Bordentown, New Jersey.

Market Value + Brokerage equals whole cost, therefore gain % was $1.00 - (.80 + .015) = .185$.

The net gain in money was \$364 to which we add the \$200 lost, making a gross gain of \$564. Then $18.5\% = \$564$, whence $\$564 \div .185 = \$3058\frac{2}{3}$, face.

To determine which answer is correct, assume the answer and work backwards.

I. Assume $\$3048\frac{2}{3}$ as face, then

$$\$3048\frac{2}{3} \times .815 = \text{cost} = \$2484\frac{2}{3},$$

$$\$3048\frac{2}{3} - \$200(\text{lost}) = \$2848\frac{2}{3}$$

$$\$2848\frac{2}{3} - \$2484\frac{2}{3} = \$364, \text{ net gain. Answer.}$$

II. Assume \$3000 as face, then the same operations produce a gain of only \$355.

Also solved by A. P. REED, H. C. WHITTAKER, P. S. BERG, and J. SCHEFFER.

We received solutions of problem 58, too late for credit in last issue, from J. SCHEFFER, E. R. ROBBINS, and P. S. BERG.

PROBLEMS.

62. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Irving College, Mechanicsburg, Pennsylvania.

A dealer buys milk at $m=5$ cents per quart, and sells it at $n=6$ cents per quart. How much water has he put with the milk, if his rate of profit is $p=60$ per cent.?

63. Proposed by J. A. CALDERHEAD, M. Sc., Professor of Mathematics, Curry University, Pittsburg, Pennsylvania.

I owe A \$100 due in 2 years, and \$200 due in 4 years; when will the payment of \$300 equitably discharge the debt, money being worth 6 per cent.?

64. Proposed by J. K. ELLWOOD, A. M., Principal of Colfax School, Pittsburg, Pennsylvania.

If 27 men in 10 days of 7 hours each for \$375 dig a ditch 70 rods long, 25 feet wide, and 4 feet deep, how long a ditch 40 feet wide and 3 feet deep will 15 men dig in 16 days of 9 hours each for \$500?

[77 2-9 rods and 88 8-9 rods have been obtained. Which is correct?]